I CLAIM:

1. A thermal chemical vapor deposition process for depositing a Si-containing material on a surface, comprising

providing a chemical vapor deposition chamber having disposed therein a substrate,

introducing a gas to said chamber, wherein said gas is comprised of a chemical precursor selected from the group consisting of a compound containing at least one silicon atom and at least one carbon atom and a compound containing at least one carbon atom and at least one oxygen atom,

depositing a Si-containing film onto said substrate by thermal chemical vapor deposition, wherein said Si-containing film has a dielectric constant of less than 3.0, as deposited.

2. The thermal chemical vapor deposition process of Claim 1 wherein said temperature is greater than about 300°C.

3. The thermal chemical vapor deposition process of Claim 1 wherein said temperature is in the range of about 350°C to about 700°C.

4. The thermal chemical vapor deposition process of Claim 1 wherein said temperature is in the range of about 400°C to about 550°C.

5. The thermal chemical vapor deposition process of Claim 1 wherein said Si-containing film has a dielectric constant of about 2.7 or lower.

6. The thermal chemical vapor deposition process of Claim 1 wherein said Si-containing film has a dielectric constant of about 2.5 or lower.

7. The thermal chemical vapor deposition process of Claim 1 wherein said gas does not contain an oxidizing agent.

8. The thermal chemical vapor deposition process of Claim 1 wherein said chemical precursor is selected from the group consisting of

siloxanes of the formula $(R_3Si)_2O$ where each R is independently H, D, F, methyl, ethyl or propyl,

(fluoroalkyl)fluorosiloxanes of the formula $[((R_f)_{3-x-y}R^1_xF_y)Si]_2O$ where R_f is a perfluoromethyl, perfluoroethyl or perfluoropropyl group, R^1 is H or D, x is 0 or 1, y is 1 or 2, and x + y = 1 or 2,

(fluoroalkyl)silanes of the formula $(R_f)_{4-a}SiR^1_a$ where R_f is a perfluoromethyl, perfluoroethyl or perfluoropropyl group, R^1 is H or D, and a is 0, 1, 2, or 3,

(alkyl)fluorosilanes of the formula $R^2_{4-b}SiF_b$ where R^2 is methyl, ethyl or propyl, and b is 1, 2, or 3,

(fluoroalkyl)fluorosilanes of the formula $(R_f)_{4-c-b}SiR^1_cF_b$ where R_f is a perfluoromethyl, perfluorethyl or perfluoropropyl group, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

alkylsiloxysilanes of the formula $(R_3SiO)_{4-b}SiR_b$ where each R is independently H, D, F, methyl, ethyl or propyl, and b is 1, 2 or 3,

alkoxysilanes of the formula $(R^2O)_{4-a}SiR^1_a$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, and a is 0, 1, 2, or 3,

alkylalkoxysilanes of the formula $(R^2O)_{4-c-b}SiR^2_bR^1_c$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

silylmethanes of the formula $(H_3Si)_{4-a}CR^1_a$ where R^1 is H or D, and a is 0, 1, 2, or 3,

alkoxysilylmethanes of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

alkylalkoxysilylmethanes of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, x is 0 or 1, y is 1 or 2, z is 1 or 2, and x + y + z = 2 or 3,

alkoxymethanes of the formula $(R^3O)_{4-a}CR^1_a$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^1 is H or D, and a is 0, 1, 2, or 3,

alkylalkoxymethanes of the formula $(R^3O)_{4-c-b}R^2_bCR^1_c$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

and mixtures thereof;

9. The thermal chemical vapor deposition process of Claim 8 wherein said first chemical precursor is selected from the group consisting of

a siloxane of the formula $(H_3Si)_2O$,

a siloxane of the formula $(R_3Si)_2O$ in which at least one R is F,

a siloxane of the formula $(R_3Si)_2O$ in which at least one R is methyl or ethyl,

a (fluoroalkyl)fluorosiloxane of the formula $[((R_f)_{3-x-y}R^1_xF_y)Si]_2O$ in which R_f is trifluoromethyl,

a (fluoroalkyl)silane of the formula $(R_f)_{4-a}SiR^1_a$ in which R_f is trifluoromethyl,

an (alkyl)fluorosilane of the formula $R^2_{4-b}SiF_b$ in which R^2 is methyl or ethyl,

a (fluoroalkyl)fluorosilane of the formula $(R_f)_{4-c-b}SiR^1_cF_b$ in which R_f is trifluoromethyl,

an alkylsiloxysilane of the formula $(R_3SiO)_{4-b}SiR_b$ in which each R is independently H, D, methyl, or ethyl,

an alkoxysilane of the formula $(R^2O)_{4-a}SiR^1_a$ in which R^2 is methyl or ethyl,

an alkylalkoxysilane of the formula $(R^2O)_{4-c-b}SiR^2_bR^1_c$ in which each R^2 is independently methyl or ethyl,

an alkoxysilylmethane of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ in which R^2 is methyl or ethyl, and

an alkylalkoxysilylmethane of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ in which each R^2 is independently methyl or ethyl.

10. A thermal chemical vapor deposition process for depositing a Si-containing material on a surface, comprising

providing a chemical vapor deposition chamber having disposed therein a substrate,

introducing a gas to said chamber, wherein said gas is comprised of a first chemical precursor selected from the group consisting of

siloxanes of the formula $(R_3Si)_2O$ where each R is independently H, D, F, methyl, ethyl or propyl,

(fluoroalkyl)fluorosiloxanes of the formula $[((R_f)_{3-x-y}R^1_xF_y)Si]_2O$ where R_f is a perfluoromethyl, perfluoroethyl or perfluoropropyl group, R^1 is H or D, x is 0 or 1, y is 1 or 2, and x + y = 1 or 2,

(fluoroalkyl)silanes of the formula $(R_f)_{4-a}SiR^1_a$ where R_f is a perfluoromethyl, perfluoroethyl or perfluoropropyl group, R^1 is H or D, and a is 0, 1, 2, or 3,

(alkyl)fluorosilanes of the formula $R^2_{4-b}SiF_b$ where R^2 is methyl, ethyl or propyl, and b is 1, 2, or 3,

(fluoroalkyl)fluorosilanes of the formula $(R_f)_{4-c-b}SiR^1_cF_b$ where R_f is a perfluoromethyl, perfluorethyl or perfluoropropyl group, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

alkylsiloxysilanes of the formula $(R_3SiO)_{4-b}SiR_b$ where each R is independently H, D, F, methyl, ethyl or propyl, and b is 1, 2 or 3,

alkoxysilanes of the formula $(R^2O)_{4-a}SiR^1_a$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, and a is 0, 1, 2, or 3,

alkylalkoxysilanes of the formula $(R^2O)_{4-c-b}SiR^2_bR^1_c$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

silylmethanes of the formula $(H_3Si)_{4-a}CR^1_a$ where R^1 is H or D, and a is 0, 1, 2, or 3,

alkoxysilylmethanes of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

alkylalkoxysilylmethanes of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, x is 0 or 1, y is 1 or 2, z is 1 or 2, and x + y + z = 2 or 3,

alkoxymethanes of the formula $(R^3O)_{4-a}CR^1_a$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^1 is H or D, and a is 0, 1, 2, or 3,

alkylalkoxymethanes of the formula $(R^3O)_{4-c-b}R^2_bCR^1_c$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

and mixtures thereof;

and depositing a Si-containing film onto said substrate by thermal chemical vapor deposition at a temperature of about 300°C or higher, wherein said Si-containing film has a dielectric constant of about 3.5 or lower, as deposited.

11. The thermal chemical vapor deposition process of Claim 10 wherein said first chemical precursor is selected from the group consisting of

a siloxane of the formula $(H_3Si)_2O$,

a siloxane of the formula $(R_3Si)_2O$ in which at least one R is F,

a siloxane of the formula $(R_3Si)_2O$ in which at least one R is methyl or ethyl,

a (fluoroalkyl)fluorosiloxane of the formula $[((R_f)_{3-x-y}R^1_xF_y)Si]_2O$ in which R_f is trifluoromethyl,

a (fluoroalkyl)silane of the formula $(R_f)_{4-a}SiR^1_a$ in which R_f is trifluoromethyl,

an (alkyl)fluorosilane of the formula $R^2_{4-b}SiF_b$ in which R^2 is methyl or ethyl,

a (fluoroalkyl)fluorosilane of the formula $(R_f)_{4-c-b}SiR^1_cF_b$ in which R_f is trifluoromethyl,

an alkylsiloxysilane of the formula $(R_3SiO)_{4-b}SiR_b$ in which each R is independently H, D, methyl, or ethyl,

an alkoxysilane of the formula $(R^2O)_{4-a}SiR^1_a$ in which R^2 is methyl or ethyl,

an alkylalkoxysilane of the formula $(R^2O)_{4-c-b}SiR^2_bR^1_c$ in which each R^2 is independently methyl or ethyl,

an alkoxysilylmethane of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ in which R^2 is methyl or ethyl, and

an alkylalkoxysilylmethane of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ in which each R^2 is independently methyl or ethyl.

12. The thermal chemical vapor deposition process of Claim 10 wherein said gas is further comprised of a second chemical precursor selected from the group consisting of silane, disilane, trisilane, methane, ethane, propane, butane, oxygen, ozone, hydrogen peroxide, nitrous oxide and water.

13. The thermal chemical vapor deposition process of Claim 10 wherein said temperature is in the range of about 350°C to about 700°C.

14. The thermal chemical vapor deposition process of Claim 10 wherein said temperature is in the range of about 400°C to about 550°C.

15. The thermal chemical vapor deposition process of Claim 10 wherein said Si-containing film has a dielectric constant of about 3.0 or lower.

16. The thermal chemical vapor deposition process of Claim 10 wherein said Si-containing film has a dielectric constant of about 2.7 or lower.

17. The thermal chemical vapor deposition process of Claim 10 wherein said Si-containing film has a dielectric constant of about 2.5 or lower.

18. A chemical vapor deposition process for depositing a Si-containing material on a surface, comprising

providing a chemical vapor deposition chamber having disposed therein a substrate;

introducing a gas to said chamber, wherein said gas is comprised of a first chemical precursor selected from the group consisting of

silylmethanes of the formula $(H_3Si)_{4-a}CR^1_a$ where R^1 is H or D, and a is 0, 1, 2, or 3,

alkoxysilylmethanes of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and $c + b = 1$, 2, or 3,

alkylalkoxysilylmethanes of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, x is 0 or 1, y is 1 or 2, z is 1 or 2, and $x + y + z = 2$ or 3,

alkoxymethanes of the formula $(R^3O)_{4-a}CR^1_a$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^1 is H or D, and a is 0, 1, 2, or 3,

alkylalkoxymethanes of the formula $(R^3O)_{4-c-b}R^2_bCR^1_c$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

and mixtures thereof, and

depositing a Si-containing film onto said substrate, wherein said Si-containing film has a dielectric constant of about 3.5 or lower, as deposited.

19. The chemical vapor deposition process of Claim 18 wherein said Si-containing film is deposited by thermal chemical vapor deposition at a temperature of about 300°C or higher.

20. The chemical vapor deposition process of Claim 19 wherein said temperature is in the range of about 350°C to about 700°C.

21. The chemical vapor deposition process of Claim 19 wherein said temperature is in the range of about 400°C to about 550°C.

22. The chemical vapor deposition process of Claim 18 wherein said first chemical precursor is selected from the group consisting of

an alkoxysilylmethane of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ in which R^2 is methyl or ethyl, and

an alkylalkoxysilylmethane of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ in which each R^2 is independently methyl or ethyl.

23. The chemical vapor deposition process of Claim 18 wherein said first chemical precursor is tetrasilylmethane.

24. The chemical vapor deposition process of Claim 18 wherein said gas is further comprised of a second chemical precursor selected from the group consisting of silane, disilane, trisilane, methane, ethane, propane, butane, oxygen, ozone, hydrogen peroxide, nitrous oxide and water.

25. The thermal chemical vapor deposition process of Claim 18 wherein said Si-containing film has a dielectric constant of about 3.0 or lower.

26. The chemical vapor deposition process of Claim 18 wherein said Si-containing film has a dielectric constant of about 2.7 or lower.

27. The chemical vapor deposition process of Claim 18 wherein said Si-containing film has a dielectric constant of about 2.5 or lower.

28. An alkoxysilylmethane of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3.

29. A process for making the alkoxysilylmethane of Claim 28 which comprises reacting a halogenated alkoxymethane of the formula $(R^2O)_{4-c-b}X_bCR^1_c$ with a reagent selected from the group consisting of silyl salt, silane and disilane, where X is a halogen selected from Cl, Br, and I.

30. An alkylalkoxysilylmethane of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, x is 0 or 1, y is 1 or 2, z is 1 or 2, and x + y + z = 2 or 3.

31. A process for making the alkylalkoxysilylmethane of Claim 30 which comprises reacting a halogenated alkylalkoxymethane of the formula $(R^2O)_{4-x-y-z}R^2_zX_yCR^1_x$ with a reagent selected from the group consisting of silyl salt, silane and disilane, where X is a halogen selected from Cl, Br, and I.

32. A chemical vapor deposition process for depositing a Si-containing material on a surface, comprising

providing a chemical vapor deposition chamber having disposed therein a substrate;

introducing a first gas to said chamber, wherein said first gas is comprised of a first chemical precursor,

depositing a first Si-containing film onto said substrate, wherein said first Si-containing film has a dielectric constant of about 3.5 or lower, as deposited, and wherein said first Si-containing film has a thickness in the range of about 50Å to about 5000Å,

introducing a second gas to said chamber, wherein said second gas is comprised of a second chemical precursor different from said first chemical precursor, and

depositing a second Si-containing film onto said first Si-containing film to provide a multi-layered Si-containing film,

wherein said second Si-containing film has a dielectric constant of about 3.5 or lower, as deposited, wherein said second Si-containing film has a thickness in the range of about 50Å to about 5000Å, and wherein said multi-layered Si-containing film has a dielectric constant of about 3.5 or lower, as deposited.

33. The chemical vapor deposition process of Claim 32 wherein said multi-layered Si-containing film has a dielectric constant of about 3.0 or lower.

34. The chemical vapor deposition process of Claim 32 wherein said multi-layered Si-containing film has a dielectric constant of about 2.7 or lower.

35. The chemical vapor deposition process of Claim 32 wherein said multi-layered Si-containing film has a dielectric constant of about 2.5 or lower.

36. The chemical vapor deposition process of Claim 32 wherein said first Si-containing film is deposited by thermal chemical vapor deposition at a temperature of about 300°C or higher.

37. The chemical vapor deposition process of Claim 36 wherein said temperature is in the range of about 350°C to about 700°C.

38. The chemical vapor deposition process of Claim 36 wherein said temperature is in the range of about 400°C to about 550°C.

39. The chemical vapor deposition process of Claim 32 wherein said first chemical precursor is selected from the group consisting of

siloxanes of the formula $(R_3Si)_2O$ where each R is independently H, D, F, methyl, ethyl or propyl,

(fluoroalkyl)fluorosiloxanes of the formula $[((R_f)_{3-x-y}R^1_xF_y)Si]_2O$ where R_f is a perfluoromethyl, perfluoroethyl or perfluoropropyl group, R^1 is H or D, x is 0 or 1, y is 1 or 2, and x + y = 1 or 2,

(fluoroalkyl)silanes of the formula $(R_f)_{4-a}SiR^1_a$ where R_f is a perfluoromethyl, perfluoroethyl or perfluoropropyl group, R^1 is H or D, and a is 0, 1, 2, or 3,

(alkyl)fluorosilanes of the formula $R^2_{4-b}SiF_b$ where R^2 is methyl, ethyl or propyl, and b is 1, 2, or 3,

(fluoroalkyl)fluorosilanes of the formula $(R_f)_{4-c-b}SiR^1_cF_b$ where R_f is a perfluoromethyl, perfluorethyl or perfluoropropyl group, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

alkylsiloxysilanes of the formula $(R_3SiO)_{4-b}SiR_b$ where each R is independently H, D, F, methyl, ethyl or propyl, and b is 1, 2 or 3,

alkoxysilanes of the formula $(R^2O)_{4-a}SiR^1_a$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, and a is 0, 1, 2, or 3,

alkylalkoxysilanes of the formula $(R^2O)_{4-c-b}SiR^2_bR^1_c$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

silylmethanes of the formula $(H_3Si)_{4-a}CR^1_a$ where R^1 is H or D, and a is 0, 1, 2, or 3,

alkoxysilylmethanes of the formula $(R^2O)_{4-c-b}(H_3Si)_bCR^1_c$ where R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

alkylalkoxysilylmethanes of the formula $(R^2O)_{4-x-y-z}R^2_z(H_3Si)_yCR^1_x$ where each R^2 is independently methyl, ethyl or propyl, R^1 is H or D, x is 0 or 1, y is 1 or 2, z is 1 or 2, and x + y + z = 2 or 3,

alkoxymethanes of the formula $(R^3O)_{4-a}CR^1_a$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^1 is H or D, and a is 0, 1, 2, or 3,

alkylalkoxymethanes of the formula $(R^3O)_{4-c-b}R^2_bCR^1_c$ where R^3 is methyl, ethyl, propyl, or t-butyl, R^2 is methyl, ethyl or propyl, R^1 is H or D, c is 0, 1, or 2, b is 1, 2, or 3, and c + b = 1, 2, or 3,

and mixtures thereof.

40. The chemical vapor deposition process of Claim 32 wherein said second chemical precursor contains Si and C.

41. The chemical vapor deposition process of Claim 32 wherein said second gas is further comprised of a third chemical precursor selected from the group consisting of silane, disilane, trisilane, methane, ethane, propane, butane, oxygen, ozone, hydrogen peroxide, nitrous oxide and water.

42. The chemical vapor deposition process of Claim 32 wherein said first Si-containing film and said second Si-containing film each independently have a thickness in the range of about 150Å to about 2500Å.

43. The chemical vapor deposition process of Claim 32 which further comprises

introducing a third gas to said chamber, wherein said third gas is comprised of a third chemical precursor different from said second chemical precursor, and

depositing a third Si-containing film onto said second Si-containing film to provide a multi-layered Si-containing film having at least three layers, wherein said third Si-containing film has a dielectric constant of about 3.5 or lower, as deposited, and wherein said third Si-containing film has a thickness in the range of about 50Å to about 5000Å.

44. The chemical vapor deposition process of Claim 43 wherein said multi-layered Si-containing film having at least three layers has a dielectric constant of about 3.0 or lower.

45. The chemical vapor deposition process of Claim 43 wherein said multi-layered Si-containing film having at least three layers has a dielectric constant of about 2.7 or lower.

46. The chemical vapor deposition process of Claim 43 wherein said multi-layered Si-containing film having at least three layers has a dielectric constant of about 2.5 or lower.

47. The chemical vapor deposition process of Claim 43 wherein said first Si-containing film is deposited by thermal chemical vapor deposition at a temperature of about 300°C or higher.

48. The chemical vapor deposition process of Claim 47 wherein said temperature is in the range of about 350°C to about 700°C.

49. The chemical vapor deposition process of Claim 47 wherein said temperature is in the range of about 400°C to about 550°C.

50. The chemical vapor deposition process of Claim 43 wherein said first Si-containing film, said second Si-containing film and said third Si-containing film each independently have a thickness in the range of about 150Å to about 2500Å.

51. A multi-layered film comprised of at least a first layer and a second layer in contact with said first layer, wherein

said first layer is comprised of an amount of silicon in the range of about 1% to about 60 %, an amount of carbon in the range of about 10% to about 90%, an amount of oxygen in the range of 0 % to about 35%, and an amount of fluorine in the range of 0% to about 67%, each by weight based on total weight; and

said second layer is comprised of an amount of silicon in the range of about 1% to about 50%, an amount of carbon in the range of about 10% to about 60%, an amount of oxygen in the range of 0 % to about 30%, and an amount of fluorine in the range of 0 % to about 67%, each by weight based on total weight,

wherein said multi-layer film has a dielectric constant of about 3.0 or lower, and

wherein said second layer has an elemental composition that is substantially different from said first layer.

52. The multi-layered film of Claim 51 wherein said first layer is comprised of an amount of fluorine in the range of 0% to about 10%, and wherein said second layer is comprised of an amount of fluorine in the range of about 20 % to about 65%, each by weight based on total weight.

53. The multi-layered film of Claim 51 in which the interface between said first layer and said second layer is graded.

54. The multi-layered film of Claim 51 wherein said first layer and said second layer each independently have a thickness in the range of about 150Å to about 2500Å.

55. The multi-layered film of Claim 51 which is further comprised of a third layer in contact with said second layer,

wherein said third layer is comprised of an amount of silicon in the range of about 1% to about 60%, an amount of carbon in the range of about 10% to

about 90%, an amount of oxygen in the range of 0% to about 35%, and an amount of fluorine in the range of 0% to about 65%, each by weight based on total weight, and

wherein said third layer has an elemental composition that is substantially different from said second layer.

56. The multi-layered film of Claim 55, wherein said first layer is comprised of an amount of fluorine in the range of 0% to 10%, said second layer is comprised of an amount of fluorine in the range of about 20% to about 65%, and said third layer is comprised of an amount of fluorine in the range of 0% to about 10%, each by weight based on total weight.

57. The multi-layered film of Claim 55, wherein said first layer is comprised of an amount of fluorine in the range of 0% to 10%, said second layer is comprised of an amount of silicon in the range of about 10% to about 35%, and said third layer is comprised of an amount of fluorine in the range of 20% to about 65%, each by weight based on total weight.

58. The multi-layered film of Claim 55, wherein the interface between said third layer and said second layer is graded.

59. The multi-layered film of Claim 55 wherein said first layer and said second layer each independently have a thickness in the range of about 150Å to about 2500Å.